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EXAMINER	
CURS, NATHAN M	
ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 02/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/046,139	WAY, WINSTON	
	Examiner	Art Unit	
	Nathan Curs	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,9,17-27 and 52-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,9,17-27 and 52-56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: page 8, line 12 and page 9, line 22 are missing proper serial numbers.

In addition, several instances of "sub-wavelengths 16" occur throughout the specification. However, reference character 16 doesn't refer to sub-wavelengths in any of the figures.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 53 and 55 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding the method claim 53, the purpose, use, function or structure of the claimed "wavelength-tunable" limitation of the receivers with respect to the method is not disclosed or described in the specification. Simply adding the claim language to the brief summary section of the specification does not overcome the lack of enablement for the claim language.

Regarding claim 55, the purpose, use, function or structure of the claimed "wavelength-tunable" limitation of the receivers is not disclosed or described in the specification. Simply

adding the claim language to the brief summary section of the specification does not overcome the lack of enablement for the claim language.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-4, 9, 17-27, 52, 54 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swanson et al. ("Swanson") (US Patent No. 6433904) in view of Colbourne et al. ("Colbourne") (US Patent No. 6560252).

Regarding claim 1, Swanson discloses a method of transmitting optical signals in an optical communication system, comprising: receiving an input signal that has a first data rate (fig. 4, element 12b" and col. 9, lines 9-19); splitting the input signal into a plurality of sub signals which carry different split portions of information carried in the input signal (col. 8, line 22 to col. 9, line 19); using the sub signals to control a plurality of optical transmitters to produce a plurality of optical signals of different sub-wavelengths that carry the different split portions of the information, respectively, wherein the plurality of subwavelengths are spaced sufficiently close in wavelength to provide a spectral efficiency of all the subwavelengths of the plurality of subwavelengths that is close to or greater than a spectral efficiency of the optical input (col. 8, line 22 to col. 9, line 19); and combining the plurality of the optical signals of different subwavelengths into a single fiber to transmit to a destination (fig. 4, optical multiplexer element). Swanson discloses the optical transmitters as using wavelength locking as well known in the art (col. 9, lines 15-19), but does not spell out the use of tunable transmitters.

Colbourne discloses a wavelength locker optical transmitter using a tunable laser (fig. 1 and col. 4, lines 37-45). It would have been obvious to one of ordinary skill in the art at the time of the invention to use tunable lasers with wavelength lockers in the system of Swanson, in order to provide a wavelength locked signal that responds substantially fast and is highly accurate, as taught by Colbourne.

Regarding claim 2, the combination of Swanson and Colbourne discloses the method of claim 1, wherein a total bandwidth occupied by the subwavelengths is within a same channel window of the optical input (Swanson: col. 8, lines 51-54 and col. 9, lines 9-15), but does not explicitly disclose the channel window as an ITU window. However, given Swanson's disclosure of DWDM, the examples of 100 GHz channel spacing and 30 GHz channel bandwidth, and disclosing fitting the subwavelengths within the bandwidth of the original wavelength channel, it would have been obvious to one of ordinary skill in the art at the time of the invention that the system of Swanson would conform to the well known ITU DWDM channel standard, since adhering to well known standards is conventional and enables a system design to be more widely accepted by customers.

Regarding claim 3, the combination of Swanson and Colbourne discloses the method of claim 2, wherein the total bandwidth occupied by the subwavelengths fits through filters set for the bandwidth occupied by the input signal (Swanson: col. 9, lines 9-19). Swanson does not explicitly disclose that the total bandwidth occupied by the subwavelengths is less than the bandwidth occupied by the optical input; however, it would have been obvious to one of ordinary skill in the art at the time of the invention that the total bandwidth occupied by the subwavelengths would be less than the bandwidth occupied by the optical input, to provide the benefit of the combined subwavelengths fitting through existing filters used in the system with some margin.

Regarding claim 4, the combination of Swanson and Colbourne discloses the method of claim 2, wherein the total bandwidth occupied by the subwavelengths is 5 times or less than a bandwidth occupied by the input signal (Swanson: col. 9, lines 9-19, where four subwavelengths fitting within the original channel bandwidth means the bandwidth occupied by the subwavelengths is less than five times the bandwidth of the channel bandwidth).

Regarding claim 9, the combination of Swanson and Colbourne discloses the method of claim 1, further comprising a wavelength locker to control a corresponding optical transmitter against a drift in wavelength (Swanson: fig. 4 and col. 9, lines 9-19).

Regarding claim 17, the combination of Swanson and Colbourne discloses the method of claim 1, wherein a number of subwavelengths is in the range of 4 to 32 (Swanson: fig. 4, "new" spectrum and col. 9, lines 9-19).

Regarding claim 18, the combination of Swanson and Colbourne discloses the method of claim 1, wherein the first data rate is 10 Gb/sec or more (Swason: col. 10, lines 12-23).

Regarding claim 19, the combination of Swanson and Colbourne discloses the method of claim 1, wherein a subwavelength data rate of each subwavelength 50 Gb/s or less, and spacing of the subwavelengths is 25 GHz or less (Swanson: col. 9, lines 9-19).

Regarding claim 20, the combination of Swanson and Colbourne discloses the method of claim 1, wherein a subwavelength data rate of each subwavelength is 10 Gb/s or less (Swanson: col. 10, lines 12-23). Swanson discloses the example of four subwavelengths fitting within the original 30 GHz window (Swanson: col. 9, lines 9-19), but does not explicitly disclose that the spacing of the subwavelengths is in the range of 5 to about 25 GHz. However, in the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art a prima facie case of obviousness exists (see MPEP section 2144.05).

Regarding claims 21, the combination of Swanson and Colbourne discloses the method of claim 1, wherein a subwavelength data rate of each subwavelength is 10 Gb/s or less (Swanson: col. 10, lines 12-23). Swanson discloses the example of four subwavelengths fitting within the original 30 GHz window (Swanson: col. 9, lines 9-19), but does not explicitly disclose that the spacing of the subwavelengths is in the range of 6 to about 25 GHz. However, in the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art a prima facie case of obviousness exists (see MPEP section 2144.05).

Regarding claims 22, the combination of Swanson and Colbourne discloses the method of claim 1, wherein a subwavelength data rate of each subwavelength is 2.5 Gb/s or less (Swanson: col. 10, lines 12-23). Swanson discloses the example of four subwavelengths fitting within the original 30 GHz window (Swanson: col. 9, lines 9-19), but does not explicitly disclose that the spacing of the subwavelengths is in the range of 3 to about 12.5 GHz. However, in the case where the claimed ranges overlap or lie inside ranges disclosed by the prior art a prima facie case of obviousness exists (see MPEP section 2144.05).

Regarding claims 23, 24 and 26, the combination of Swanson and Colbourne discloses the method of claim 1, and discloses breaking up an aggregate rate signal into multiple lower rate signals via inverse multiplexing (Swanson: col. 8, lines 22-28), occupying a single wavelength channel with a plurality of channels that collectively carry the information of an original signal (Swanson: col. 8, lines 51-58), and discloses the example of four subwavelengths fitting within the original 30 GHz window (Swanson: col. 9, lines 9-19), but does not disclose specific examples where the number of subwavelengths is 2, 8 or 16, and a subwavelength spacing is in the range of 20 to about 100 GHz, 5 to 25 GHz, or 3 to 12.5 GHz. However, the specification states the data rates that can be utilized include but are not limited to those listed in the table showing number of subwavelengths and corresponding subwavelength spacings

(specification page 7, line 18 to page 8, line 1). This is not a disclosure of criticality for the numbers of subwavelengths and subwavelength spacings versus other numbers of subwavelengths and subwavelength spacing. Absent any disclosure of criticality, the claimed limitations for number of subwavelengths and subwavelength spacing would have been a result of obvious engineering design choice.

Regarding claim 25, the combination of Swanson and Colbourne discloses the method of claim 1, wherein a number of subwavelengths is 4 (Swanson: fig. 4 and col. 9, lines 9-19). Swanson discloses the example of four subwavelengths fitting within the original 30 GHz window, but does not explicitly disclose that the spacing of the subwavelengths is in the range of 6 to about 25 GHz. However, in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists (see MPEP section 2144.05).

Regarding claim 27, the combination of Swanson and Colbourne discloses the method of claim 1, wherein a number of subwavelengths is 4 (Swanson: fig. 4 and col. 9, lines 9-19). Swanson discloses the example of four subwavelengths fitting within the original 30 GHz window, but does not explicitly disclose that the spacing of the subwavelengths is in the range of 3 to about 12.5 GHz. However, in the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists (see MPEP section 2144.05).

Regarding claim 52, the combination of Swanson and Colbourne discloses the method of claim 1, further comprising: receiving the plurality of the optical signals of different sub-wavelengths from the single fiber at the destination (Swanson: fig. 4 and col. 8, line 22 to col. 9, line 19); splitting the received plurality of the optical signals of different sub-wavelengths into separate optical signals at the different sub-wavelengths; using different optical receivers to

receive the separated optical signals at the different sub-wavelengths, respectively, and to produce electrical output signals representing the separated optical signals, respectively; and combining the electrical output signals into an output signal at the first data rate (Swanson: fig. 5 and col. 8, line 66 to col. 9 line 8).

Regarding claim 54, Swanson discloses a communication system comprising: a signal demultiplexer to separate an input signal at a high date rate into a plurality of signals each at a low data rate, wherein the plurality of signals carry different split portions of information carried in the input signal (fig. 4 and col. 8, line 22 to col. 9, line 19); a plurality of optical transmitters respectively controlled by the plurality of signals, to produce a plurality of optical signals of different sub-wavelengths that carry the different split portions of the information, respectively, wherein the plurality of sub-wavelengths are spaced sufficiently close in wavelength to provide a spectral efficiency of all the sub-wavelengths of the plurality of sub-wavelengths that is close to or greater than a spectral efficiency of the optical input (col. 8, line 22 to col. 9, line 19); wave lockers respectively coupled to the tunable optical transmitters, each wave locker controlling a corresponding optical transmitter against a drift in wavelength in the tunable optical transmitter (col. 9, lines 15-19) and an optical element to couple the plurality of the optical signals of different sub-wavelengths into a single fiber to transmit to a destination (fig. 4, optical multiplexer element). Swanson does not spell out the use of tunable transmitters. However, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine Swanson and Colbourne as described above for claim 1.

Regarding claim 55, the combination of Swanson and Colbourne discloses the system as in claim 54, further comprising a receiver terminal which comprises: an optical receiving element to separate the plurality of the optical signals of different sub-wavelengths received from the signal fiber at the destination into separate optical signals at the different sub-

wavelengths (Swanson: fig. 4 and col. 8, line 22 to col. 9, line 19); a plurality of optical receivers to receive the separate optical signals, respectively, and to produce electrical output signals representing the separated optical signals, respectively; and a unit to combine the electrical output signals into an output signal at the high data rate (Swanson: fig. 5 and col. 8, line 66 to col. 9 line 8).

6. Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Swanson (US Patent No. 6433904) in view of Dodds (US Patent No. 6259836).

Regarding claim 56, Swanson discloses a communication system, comprising: a signal demultiplexer to separate an input signal at a high date rate into a plurality of signals each at a low data rater wherein the plurality of signals carry different split portions of information carried in the input signal; optical transmitters to produce optical carrier beams; optical modulators to modulate the optical carrier beams, responsive to the plurality signals, to produce a plurality of optical sub carriers at different optical sub-wavelengths that carry the different split portions of the information, respectively (fig. 4 and col. 8, line 22 to col. 9, line 19), wherein the plurality of sub-wavelengths are spaced sufficiently close in wavelength to provide a spectral efficiency of all the sub-wavelengths of the plurality of sub-wavelengths that is close to or greater than a spectral efficiency of the optical input (col. 8, line 22 to col. 9, line 19); and an optical element to couple the plurality of the optical signals of different sub-wavelengths into a single fiber to transmit to a destination (fig. 4, optical multiplexer element). Swanson does not disclose a single optical transmitter to produce an optical carrier beam with an optical modulator to modulate the optical carrier beam in response to the plurality signals. Dodds discloses generating closely spaced wavelength WDM transmission by generating subwavelengths from single sideband modulation, and modulating the subwavelengths with data (col. 1, lines 10-14

and lines 31-35, col. 3, line 35 to col. 4, line 3, and col. 4, line 62 to col. 5, line 19 and col. 5, lines 26-33). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the single sideband modulation and data modulation teaching of Dodds to create modulated WDM wavelengths for the subwavelengths corresponding to an original channel wavelength of the system of Swanson, in order to provide the benefit of not requiring a separate laser for each subwavelength and to provide the advantage of exactly spaced subwavelengths, as taught by Dodds.

Response to Arguments

7. Applicant's arguments with respect to claims 1 and new claim 54, regarding tunable transmitters, have been considered but are moot in view of the new ground(s) of rejection.

8. Applicant's arguments with respect to the combination of Swanson and Dodd have been fully considered but they are not persuasive. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In this case, Swanson teaches using plural sources to create plural wavelength signals, where Dodds teaches using a single source to produce plural wavelength signals. Dodds provides motivation to combine by teaching the benefit of not requiring a separate laser for each subwavelength when applied to Swanson, and the advantage of creating exactly spaced subwavelengths, as described above in the rejection. The argument that Swanson does not teach a single optical transmitter to avoid the relative drift in wavelength between different

subcarriers is irrelevant to the combination. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. The Dodds teaching itself is documentary evidence to show the knowledge generally available to one of ordinary skill in the art.

9. Applicant's arguments with respect to the 112 rejections have been fully considered but they are not persuasive. Simply adding the claim language to the brief summary section of the specification does not overcome the lack of enablement for the claim language.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

11. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pairdirect.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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